MARCH 1976
No. 3

FISHING INFORMATION

Southwest Fisheries Center-La Jolla, California

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U.S. DEPARTMENT OF COMMERCE
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SOUTHWEST FISHERIES CENTER
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FISHING INFORMATION

MARCH 1976, No. 3

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PREFACE

This publication, Fishing Information, appears monthly and contains 1) fishery advisory information, 2) a narrative description of pertinent surface temperature conditions, 3) charts of winds and pressures for the eastern North Pacific, 4) charts of sea surface temperature for the North Pacific and eastern tropical Pacific, and 5) charts of subsurface temperature structure in the eastern North Pacific.

A supplement to Fishing Information appears at 15-day intervals throughout the year. This is a chart of sea surface temperature (contoured at 2°F (1°C) intervals) from Baja California to Vancouver Island out to about 135°W. Special bulletins are published in conjunction with the 15-day sea surface temperature charts which include short-term projections of albacore distribution and locations of productive fishing areas, information on oceanographic and atmospheric conditions, and other information as is appropriate during the albacore fishing season.

The Secretary of Commerce has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this publication approved by the Office of Management and Budget, August 20, 1973; this approval expires June 1976.

Submitted for publication - April 28, 1976

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ENVIRONMENTAL CHARTS ANALYZED BY:

F. Miller (Figures 8 and 9)
J. Renner (Figures 1, 2, 3, 4, 5, 6, 7, 10, 11, 12 and 15-day Supplement)

TECHNICAL EDITOR:
R. Allen
CARTOGRAPHY:
R. Allen, H. Orr

Acknowledgements

The following organizations and stations contributed data for March 1976 charts:

Inter-American Tropical Tuna Commission, La Jolla, California
Kelco Company, San Diego, California
National Oceanic and Atmospheric Administration
    National Environmental Satellite Service, Washington, D.C.
    National Marine Fisheries Service, La Jolla, California; Honolulu, Hawaii
    National Ocean Survey, Pacific Marine Center, Seattle, Washington
    National Weather Service, San Diego, California and Washington, D.C.
Fisheries Research Board of Canada, Pacific Environment Institute, West Vancouver, British Columbia by L.F. Giovando from observations by
    L. Sabourin at Langara Island Light; G. Anderson at Cape St. James Light;
    L. Collins at Kains Island Lightstation; I.G. McNeil at Amphitrite Point Light
Scripps Institution of Oceanography, La Jolla, California
Fishing Vessels, *Apollo, Bold Contender, Cabrillo, Caribe, Carol S., Carol Virginia, City of San Diego, Conquest, Danica, Elsinore, Frances Ann, Gina Karen, Jo Linda, Kathleen, Lucky Strike, Marco Polo, Maria C.J., Marla Marie, Mary Barbara, Missouri, Pan Pacific, Raeffello, Rosa Olivia, San Juan* (WX8106), *Santa Rosa, Saratoga, Theresa Ann, Venturous, Voyager* and *Willa G.*

Expendable bathythermograph and salinity observations are made by the mates and engineers of the *Californian, Hawaiian Enterprise* and *Hawaiian Queen* of Matson Navigation Co. The data are processed under supervision of D.R. McLain at the NMFS Pacific Environmental Group, Monterey, using computer facilities of the Fleet Numerical Weather Center. The project is partially supported by the National Science Foundation and the Office of Naval Research under Government NAonr-9-74.

Sea Surface Temperature and Environmental Conditions

N. CLARK AND F. MILLER

Eastern North Pacific

Seasonal cooling continued over most of the eastern North Pacific during March 1976, with sea surface temperatures dropping 1 to 2° (0.6 to 1.1°C) since February and approaching their yearly minimum values. One exception to this cooling trend occurred northwest of Hawaii where temperatures rose slightly during March.

The sea surface temperature anomaly pattern for March remains similar to the one that persisted throughout 1975 and early 1976. A large area of 1 to 3°F (0.6 to 1.7°C) above-normal temperatures extends over much of the central portion of the eastern North Pacific, while below-normal temperatures occur in the Gulf of Alaska and off the west coast of North America. The greatest changes in the anomaly pattern occurred between 40°N and 50°N and 145°W and 160°W where slightly above-normal temperatures dropped to slightly below normal and between 25°N and 35°N and 175°N and 180° where slightly below-normal values rose to slightly above normal.

A strong high pressure cell with sea level pressures up to 5 millibars above normal covered most of the eastern North Pacific south of 45 N during March. A ridge of high pressures also extended northeastward over western Canada and the western U.S. Sea level pressures were below normal over the Gulf of Alaska causing stronger than normal northwesterly to southwesterly winds between 40°N and 55°N.

Western North Pacific

The greatest change in the western North Pacific sea surface temperature pattern during March occurred in an area between 30°N and 40°N and 155°E and 180° where 1 to 2°F (0.6 to 1.1°C) below-normal temperatures increased to slightly above-normal values. The area of 2 to 4°F (1.2 to 2.2°C) below-normal temperatures east of Honshu diminished in size and intensity during the month, with above-normal temperatures appearing along the coast. Another change occurred between 15°N and 25°N and 135°E and 150°E where 1 to 3°F (0.6 to 1.7°C) below-normal temperatures rose to slightly above-normal values.

Eastern Tropical Pacific

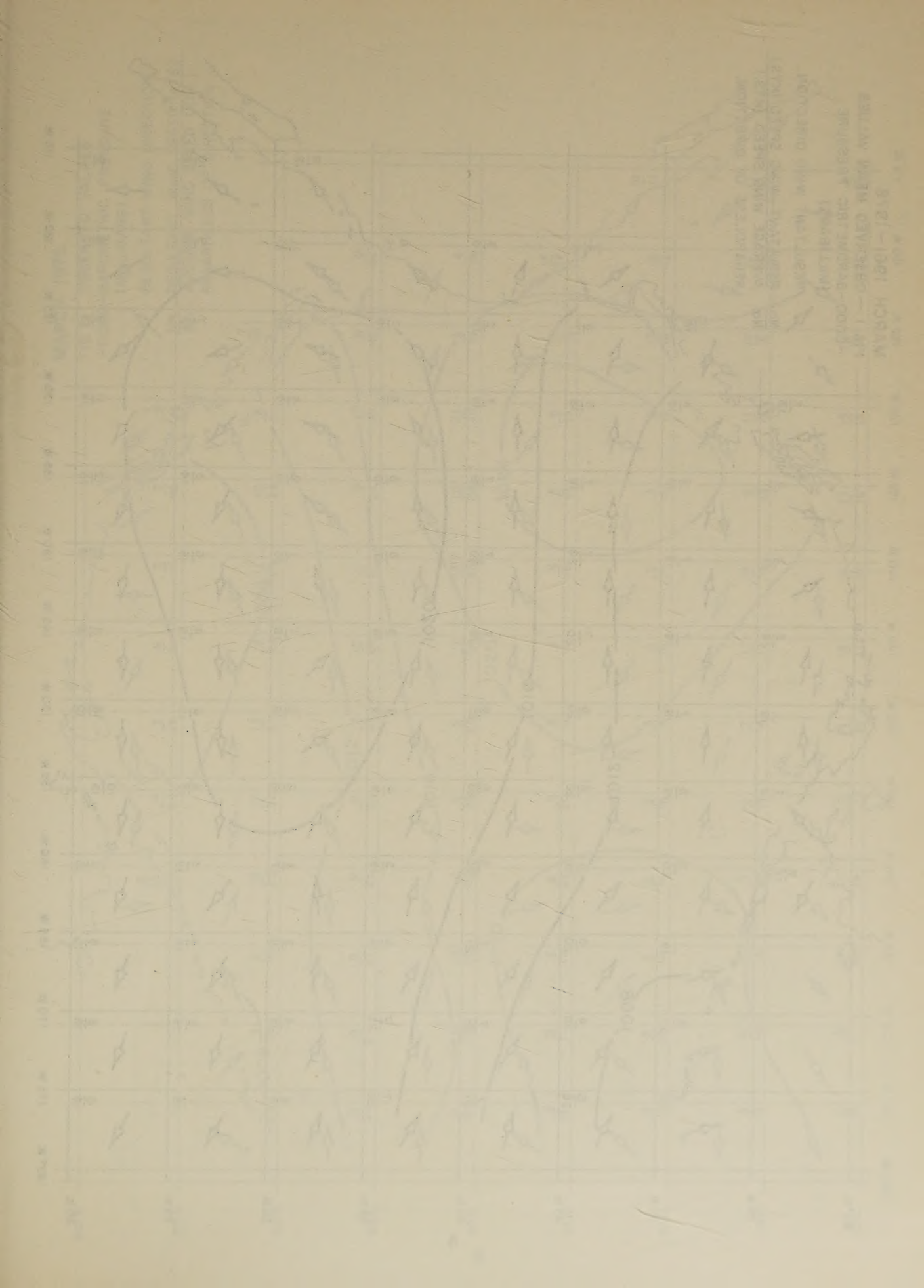
The normal seasonal fluctuation in sea surface temperature (SST) from February to March is less than 2°F (1.1°C) over most of the eastern tropical Pacific except along the equator between 85°W and 110°W. In this area from the equator to 10°S warming of greater than 2°F (1.1°C) is expected. In the Gulf of Tehuantepec and extending southward 300 miles SST's normally warm at least 2°F (1.1°C) in March. The only area with significant seasonal cooling at rates greater than 2°F (1.1°C) is along the west coast of Baja California south of 25°N. The equatorial front, represented by a strong north-south SST gradient remains as weak in March as it does in February.

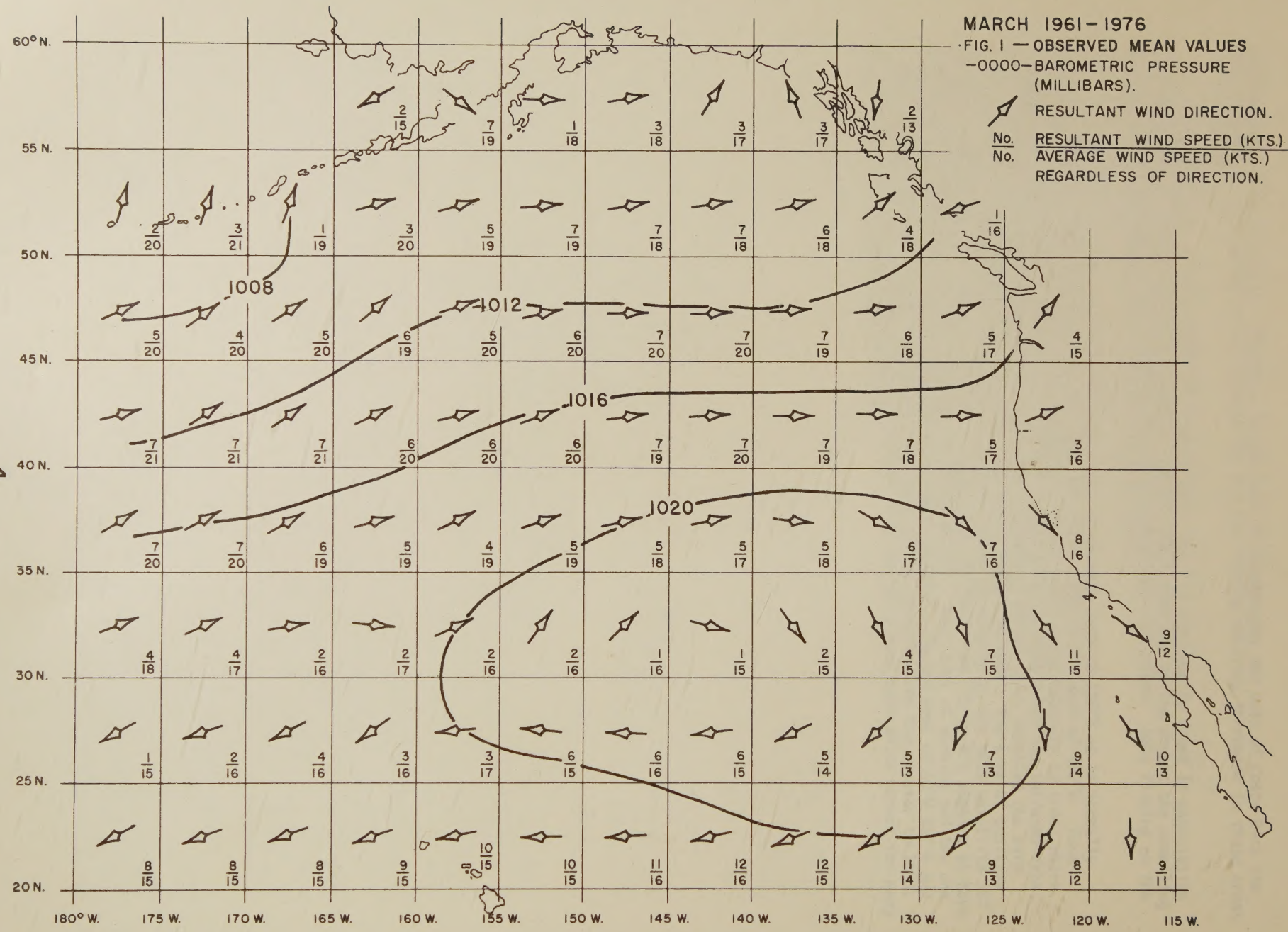
During March 1976 the SST's (Figure 8) showed a greater than normal seasonal warming in most areas east of 140°W. However, the fishing grounds in the Gulf of California and southwest of Baja California to 20°N experienced cooling greater than 2°F (1.1°C), particularly during the last half of March. As a result of rough weather and cooler than normal SST's (Figure 9) tuna fishing along Baja California decreased after mid-March. Most of the Baja California fishing shifted south of 20°N to the Revillagigedo Islands where SST's continued to be 1 to 2°F (0.6 to 1.1°C) above normal for the second month in 1976. To the east of 100°W and north of 7°N the SST's remained below 80°F (26.7°C) over large sectors of this traditionally good tuna

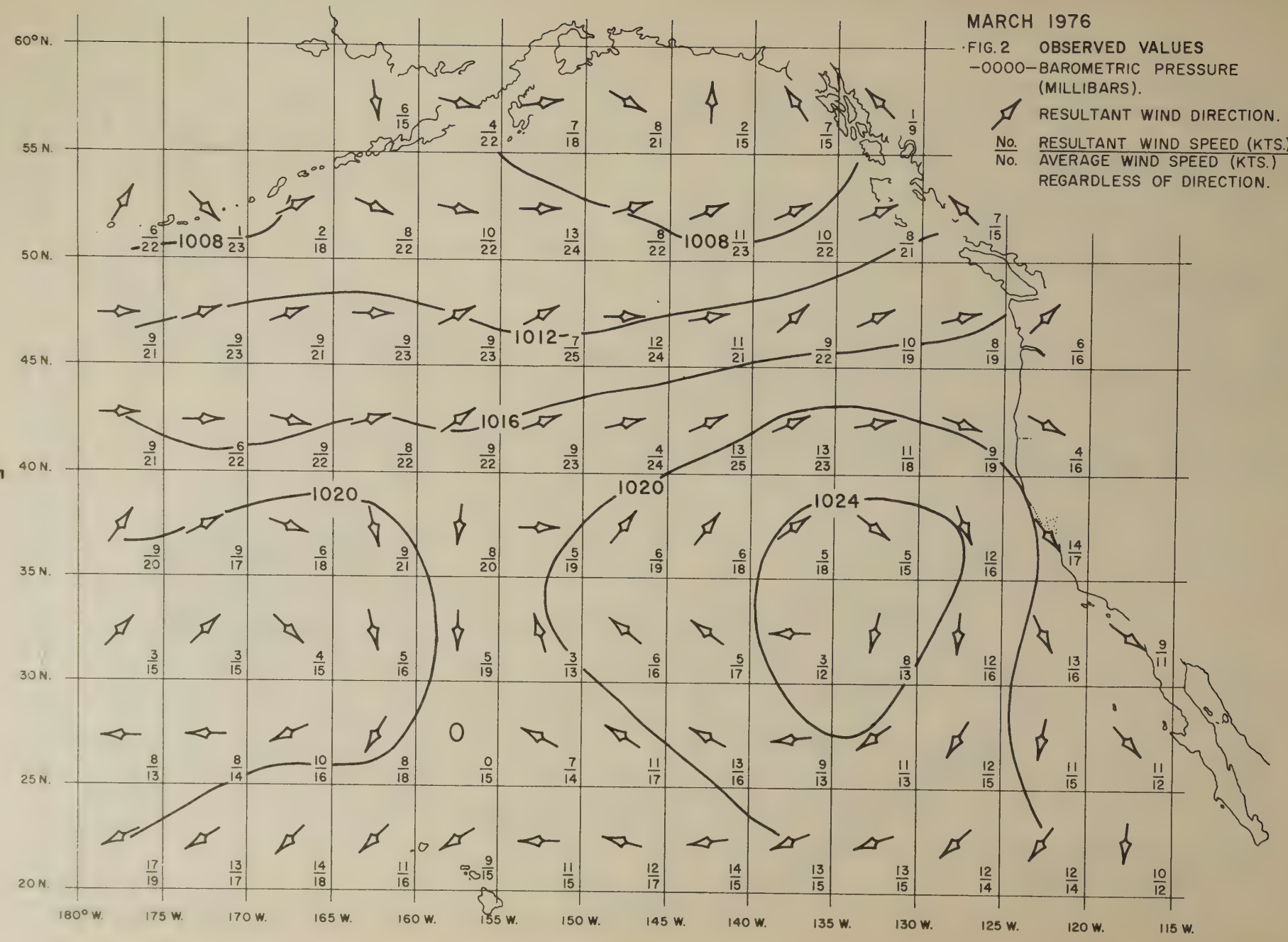
fishing area until mid-March. However, in the Gulf of Tehuantepec and west of Costa Rica the SST's warmed at above normal rates (Figure 9); and the fishing activity increased in these areas by late March.

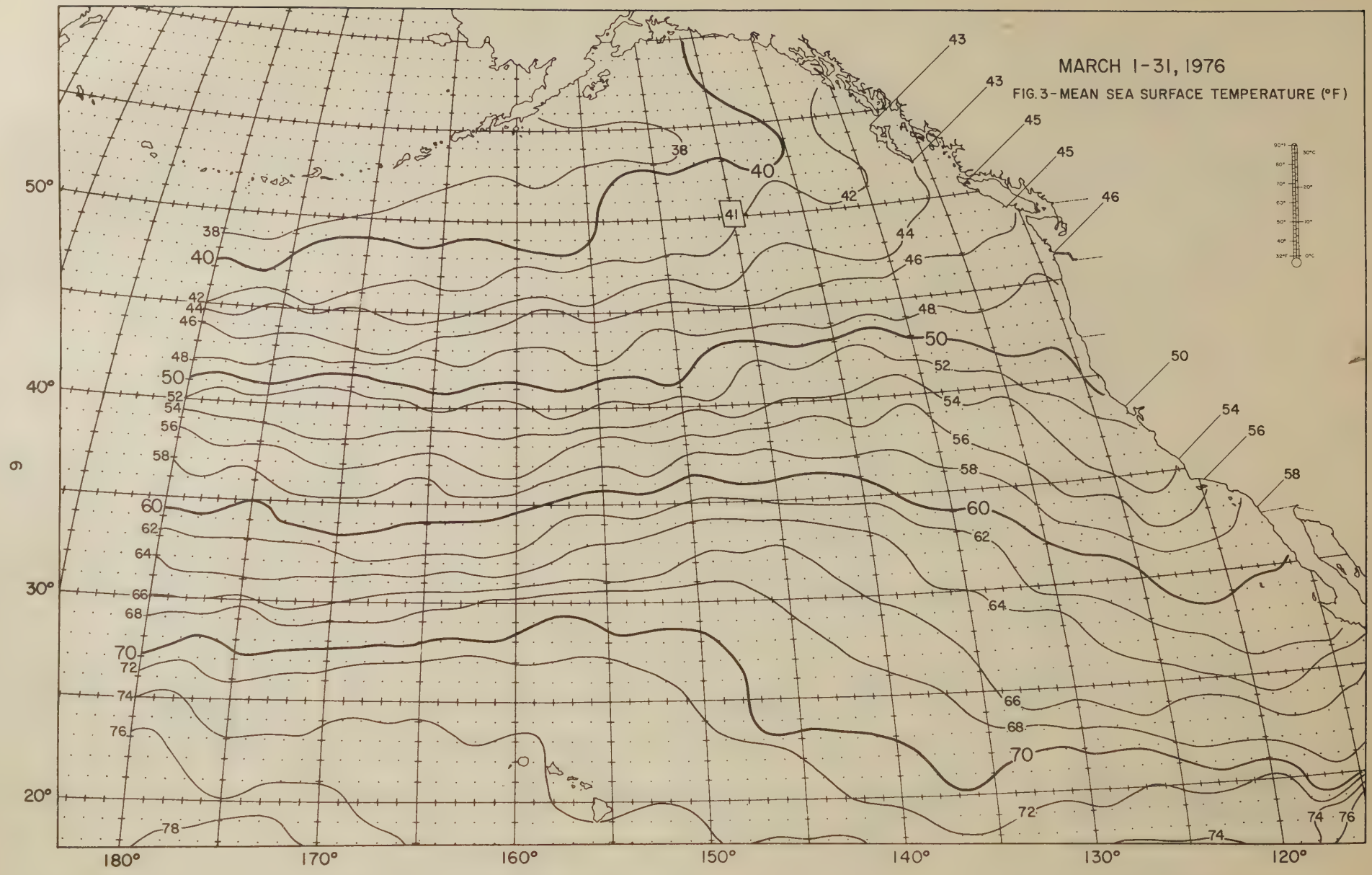
In the vicinity of 10°N, 90°W SST's below 80°F (26.7°C) are usually found in association with upwelling of cooler subsurface waters. During late winter and spring months the upwelling in this "Costa Rica dome" area brings to the surface nutrient rich water. Tuna fishing on the periphery of the upwelling dome is usually good in March.

The equatorial front in March 1976 continued to be weak east of 120°W as is normally expected. Above normal warming occurred along the equator and to 5°S east of 110°W. Tuna fishing has been very good south of the Galápagos Islands since early February in areas where SST anomalies were positive (Figure 9). The SST charts based on NOAA satellite infrared data, and prepared by the National Environmental Satellite Service (NESS), also revealed the warm pockets of SST extending south and eastward from the Galápagos Islands. The area of positive SST anomalies greater than 2°F (1.1°C) west of Peru showed up clearly in the NESS satellite SST charts and also from surface ship reports. The warming off Peru from 7°S to 8°S appears to have expanded eastward closer to the coast than in February 1976. This area of warming and the one along the coast of Ecuador has not changed much since February. To the west of 80°W SST's and the positive anomalies are not expected to show much change in April from the equator to 10°S. Along the coast of Peru south of 10°S and east of 78°W the SST's have been below normal for many months based on a scattered ship reports.




MARCH 1961 – 1976
FIG. 1 — OBSERVED MEAN VALUES
–0000– BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.)
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1008
1012
1016
1020
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.


MARCH 1976
FIG. 2 OBSERVED VALUES
-0000- BAROMETRIC PRESSURE (MILLIBARS).
RESULTANT WIND DIRECTION.
No. RESULTANT WIND SPEED (KTS.)
No. AVERAGE WIND SPEED (KTS.) REGARDLESS OF DIRECTION.
1008
1008
1012
1016
1020
1020
1024
60° N.
55 N.
50 N.
45 N.
40 N.
35 N.
30 N.
25 N.
20 N.
180° W.
175 W.
170 W.
165 W.
160 W.
155 W.
150 W.
145 W.
140 W.
135 W.
130 W.
125 W.
120 W.
115 W.


MARCH 1-31, 1976
FIG. 3-MEAN SEA SURFACE TEMPERATURE (°F)
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
38
40
41
42
43
43
45
45
46
44
46
48
50
52
54
56
58
60
62
64
66
68
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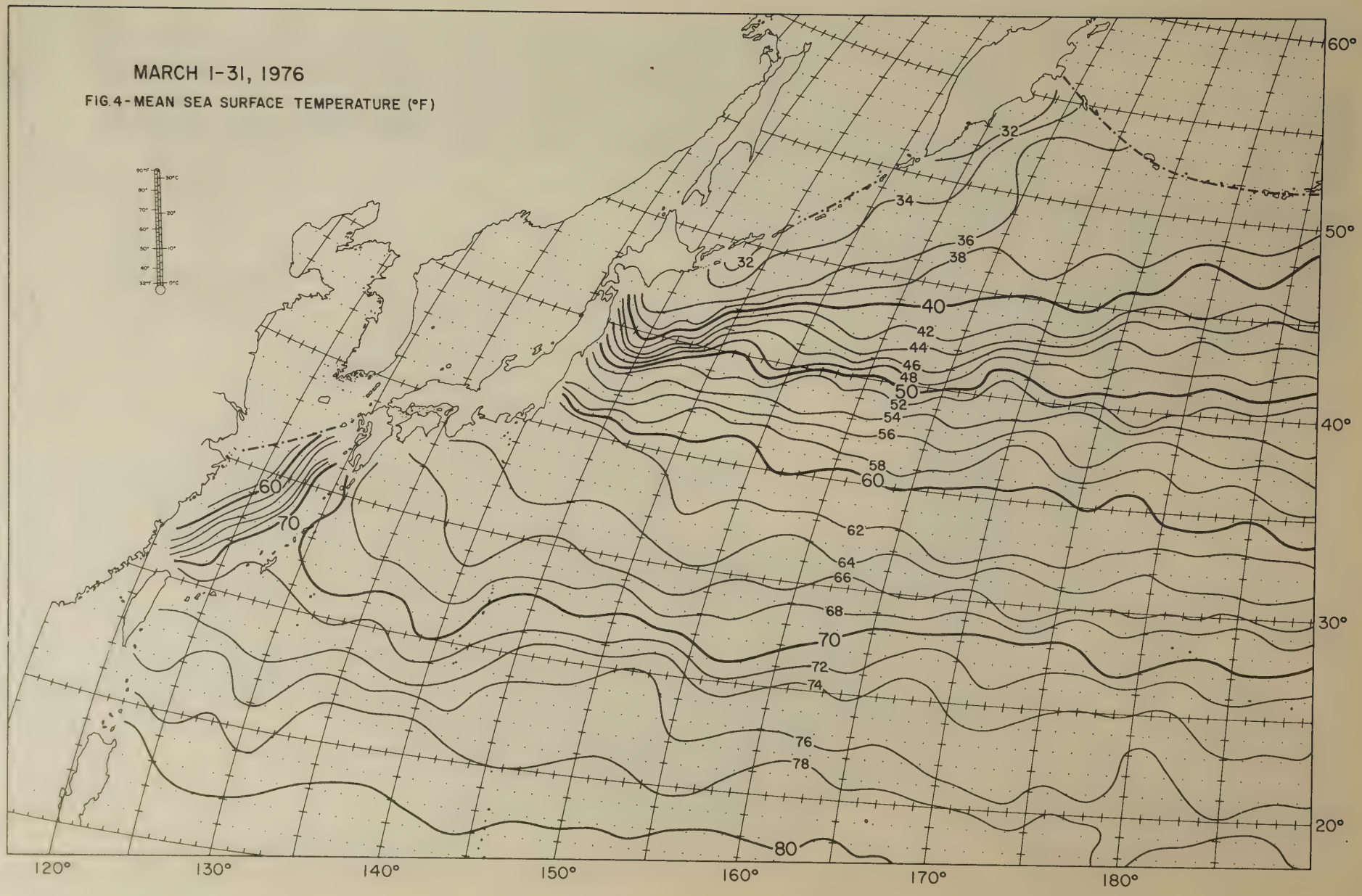
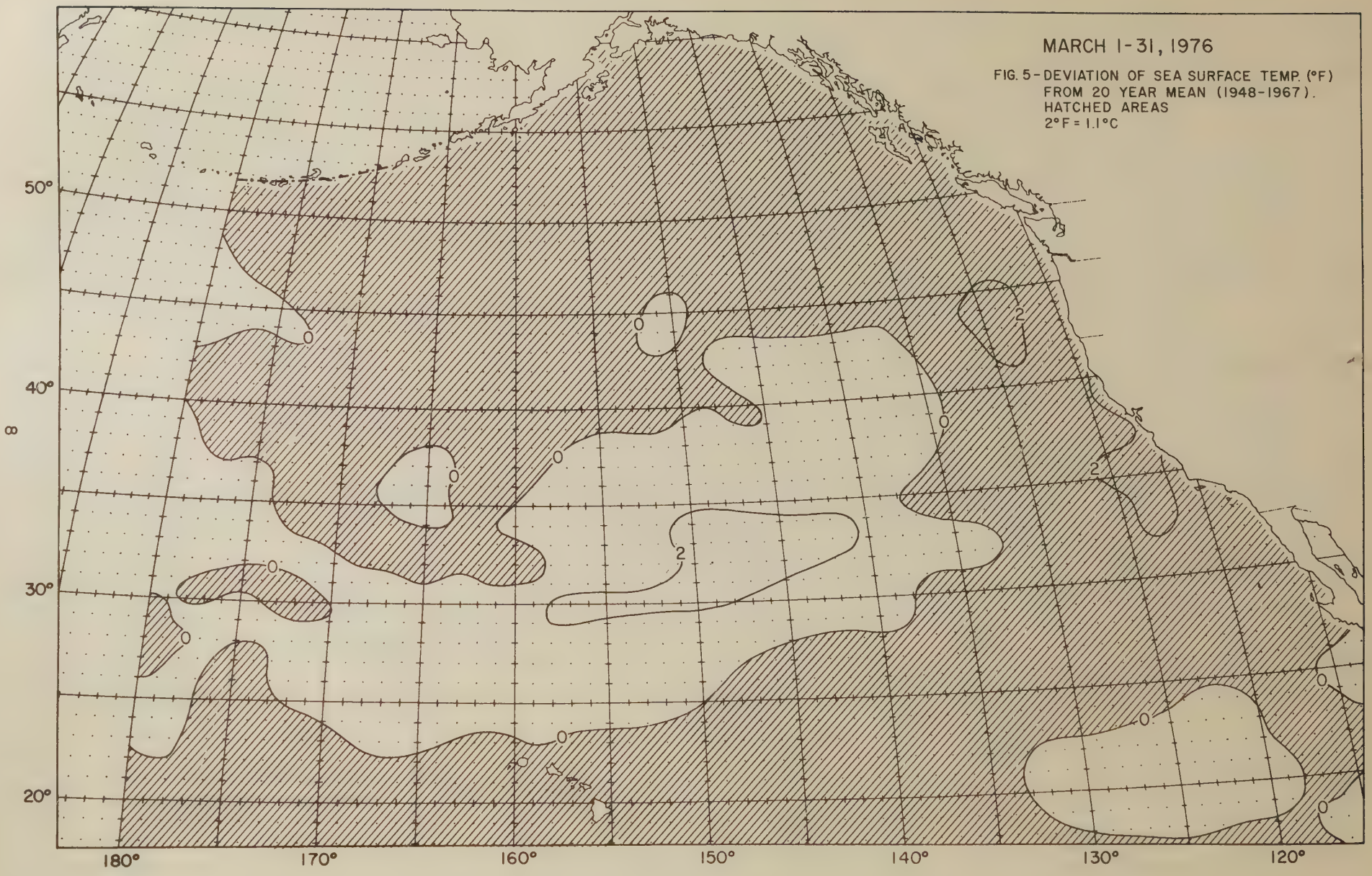
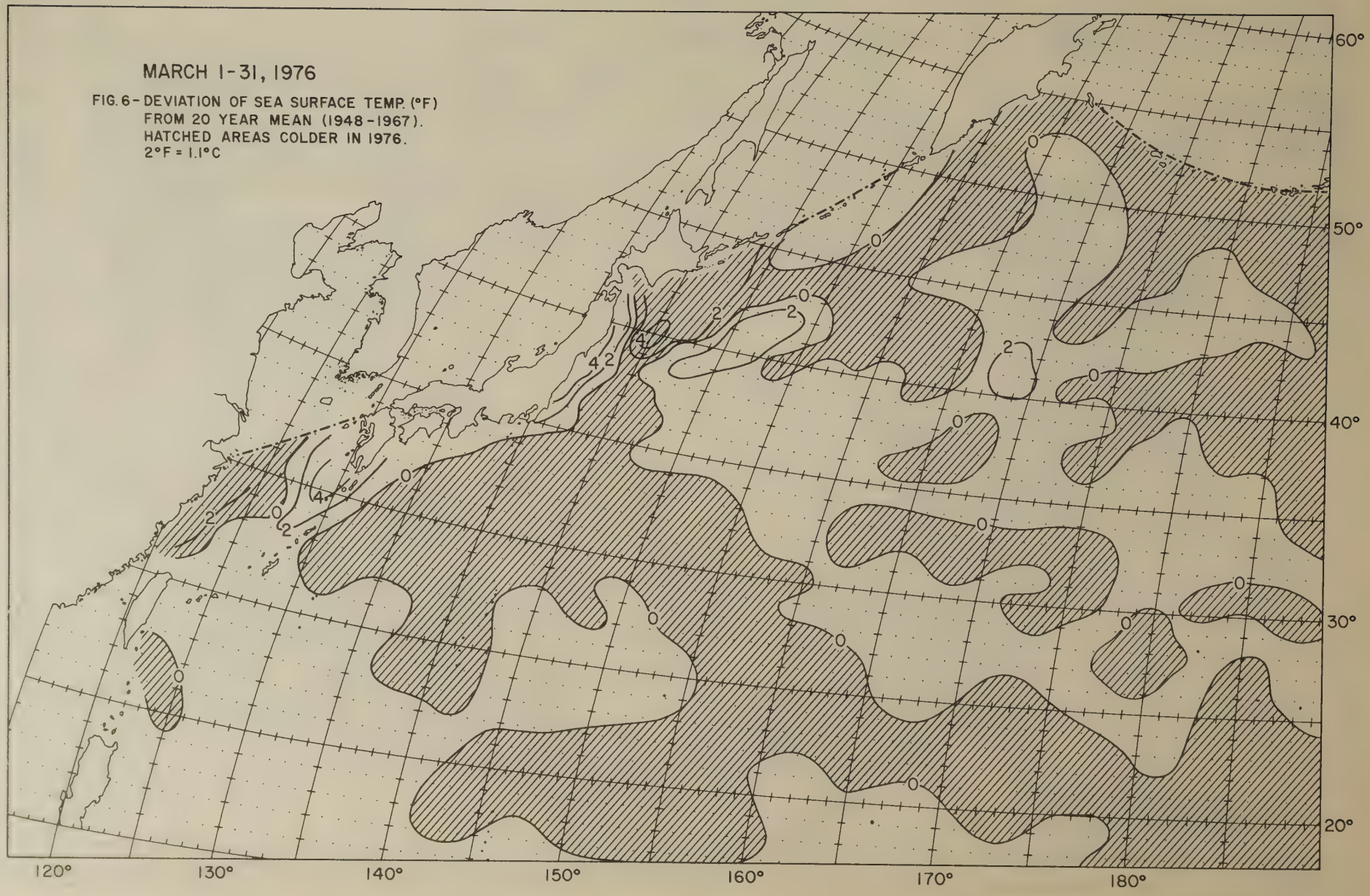
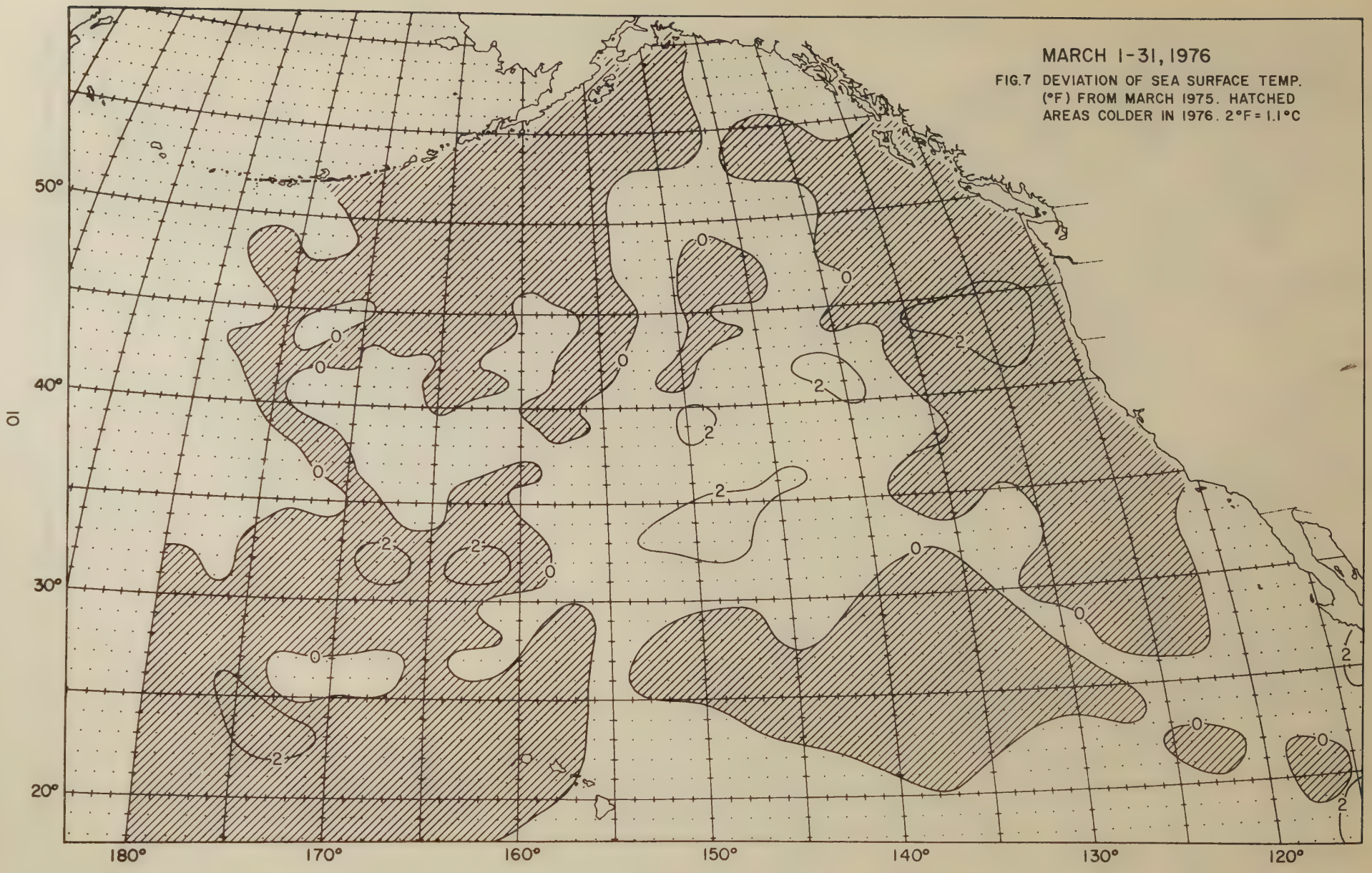
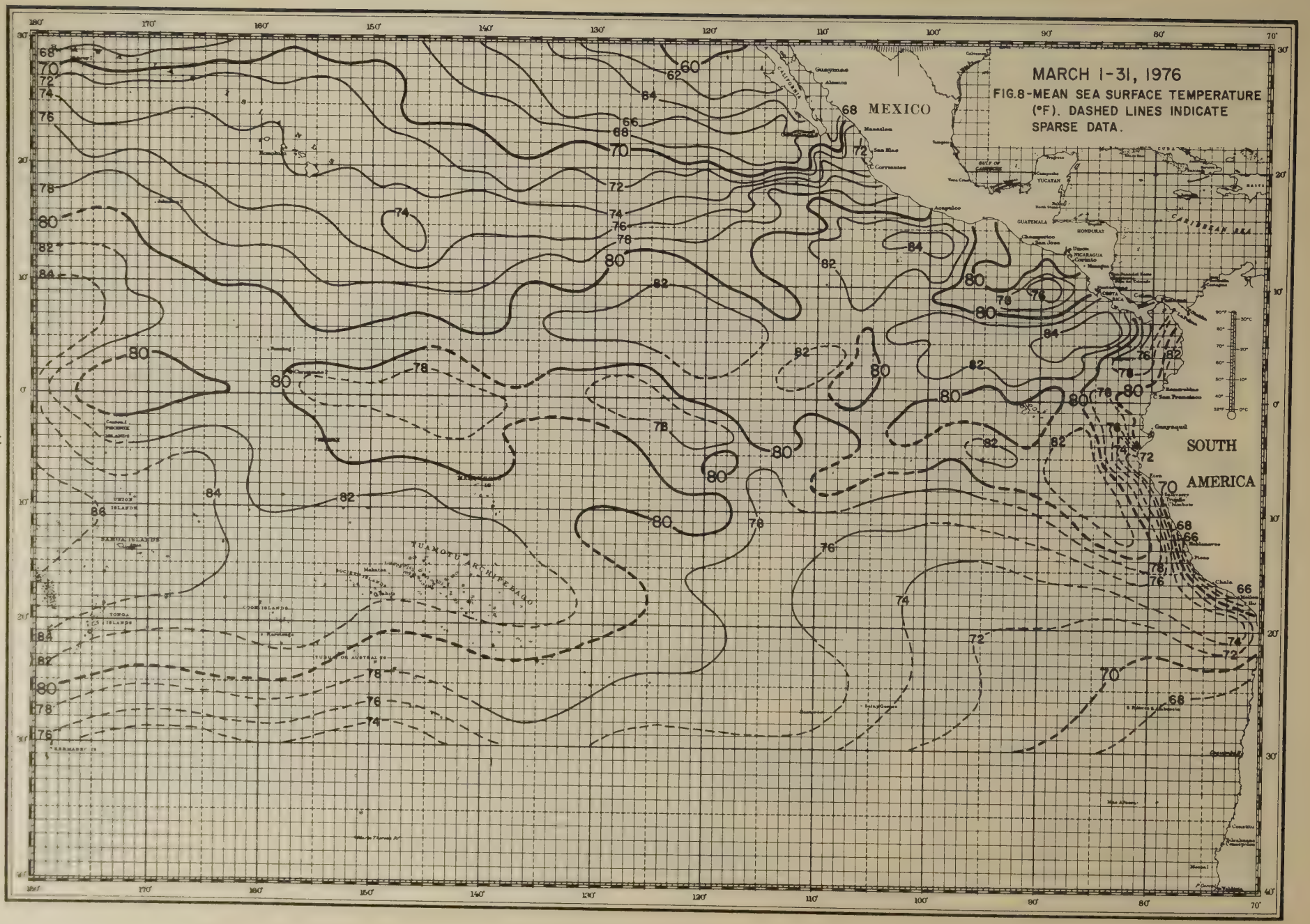
74
76


MARCH 1-31, 1976
FIG. 4 - MEAN SEA SURFACE TEMPERATURE (°F)
32
34
36
38
40
42
44
46
48
50
52
54
56
58
60
62
64
66
68
70
72
74
76
78
80
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°


MARCH 1-31, 1976
FIG. 5 - DEVIATION OF SEA SURFACE TEMP. (°F) FROM 20 YEAR MEAN (1948-1967). HATCHED AREAS 2°F = 1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
0
2


MARCH 1-31, 1976
FIG. 6 - DEVIATION OF SEA SURFACE TEMP. (°F)
FROM 20 YEAR MEAN (1948-1967).
HATCHED AREAS COLDER IN 1976.
2°F = 1.1°C
60°
50°
40°
30°
20°
120°
130°
140°
150°
160°
170°
180°


MARCH 1-31, 1976
FIG.7 DEVIATION OF SEA SURFACE TEMP. (°F) FROM MARCH 1975. HATCHED AREAS COLDER IN 1976. 2°F = 1.1°C
50°
40°
30°
20°
180°
170°
160°
150°
140°
130°
120°
0
2


MARCH 1-31, 1976
FIG.8-MEAN SEA SURFACE TEMPERATURE (°F). DASHED LINES INDICATE SPARSE DATA.
MEXICO
SOUTH AMERICA
CARIBBEAN SEA
GUATEMALA
HONDURAS
NICARAGUA
COSTA RICA
YUCATAN
GULF OF CALIFORNIA
TUAMOTU ARCHIPELAGO
SAMOA ISLANDS
TONGA ISLANDS
COOK ISLANDS
UNION ISLANDS
PHOENIX ISLANDS
Guayaquil
Acapulco
Manzanillo
Chile

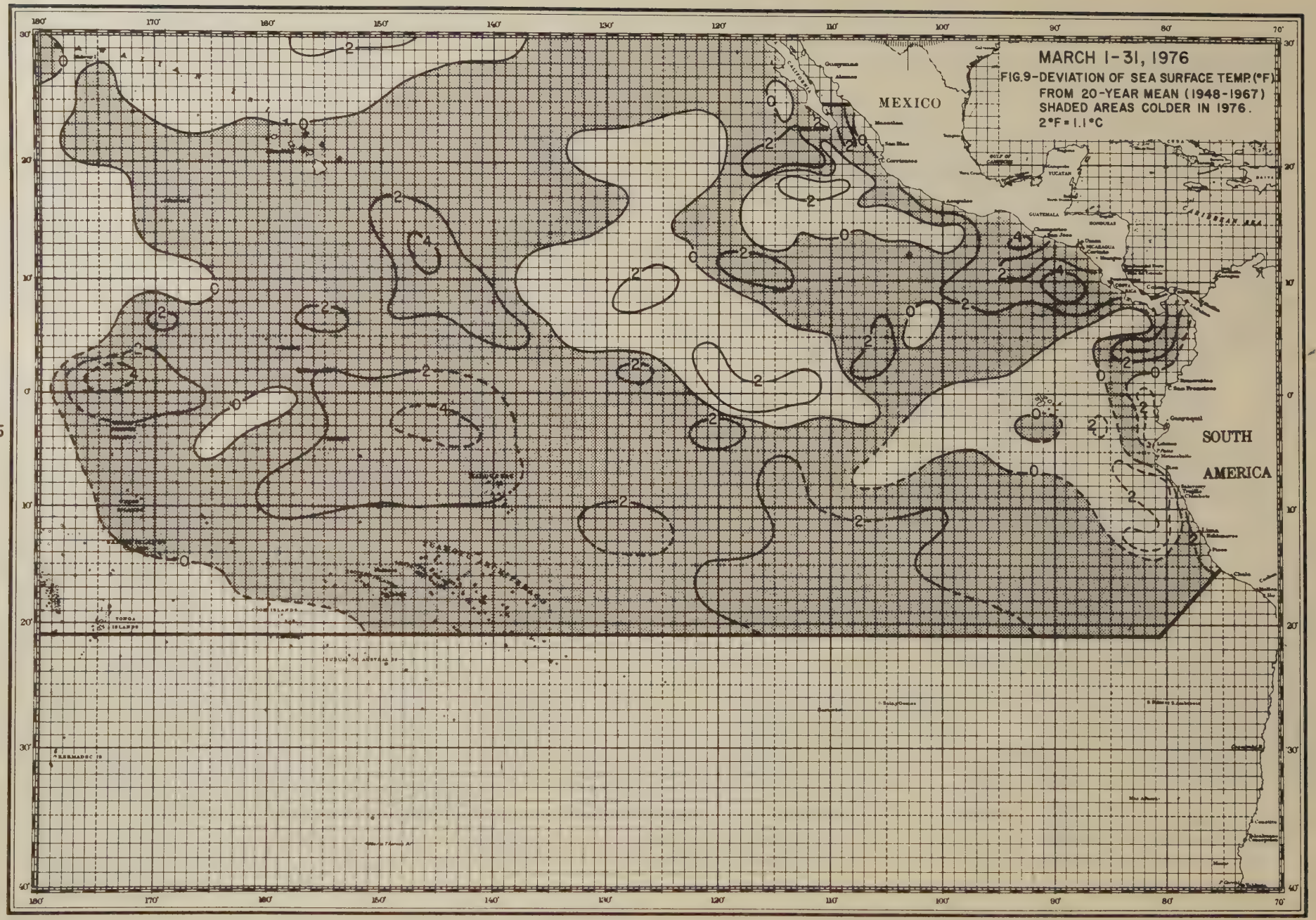
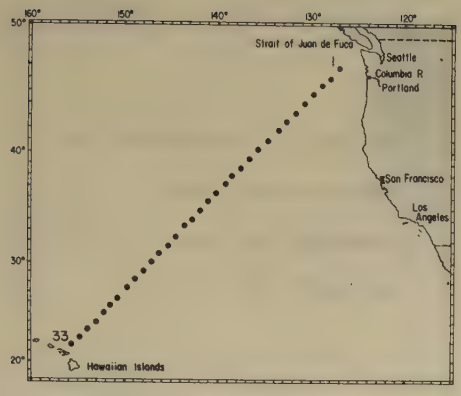
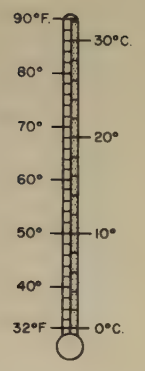

MARCH 1-31, 1976
FIG.9-DEVIATION OF SEA SURFACE TEMP.(°F)
FROM 20-YEAR MEAN (1948-1967)
SHADED AREAS COLDER IN 1976.
2°F = 1.1°C
MEXICO
SOUTH
AMERICA
CARIBBEAN SEA
GUATEMALA
HONDURAS
NICARAGUA
YUCATAN
CUBA
HAITI
TONGA
ISLANDS
COOK ISLANDS
BERMUDAS

FIGURE 10





HONOLULU – SEATTLE
(Makapuu Pt. – St. of Juan de Fuca)

MARCH 19–24, 1976

CALIFORNIAN

VOYAGE 268

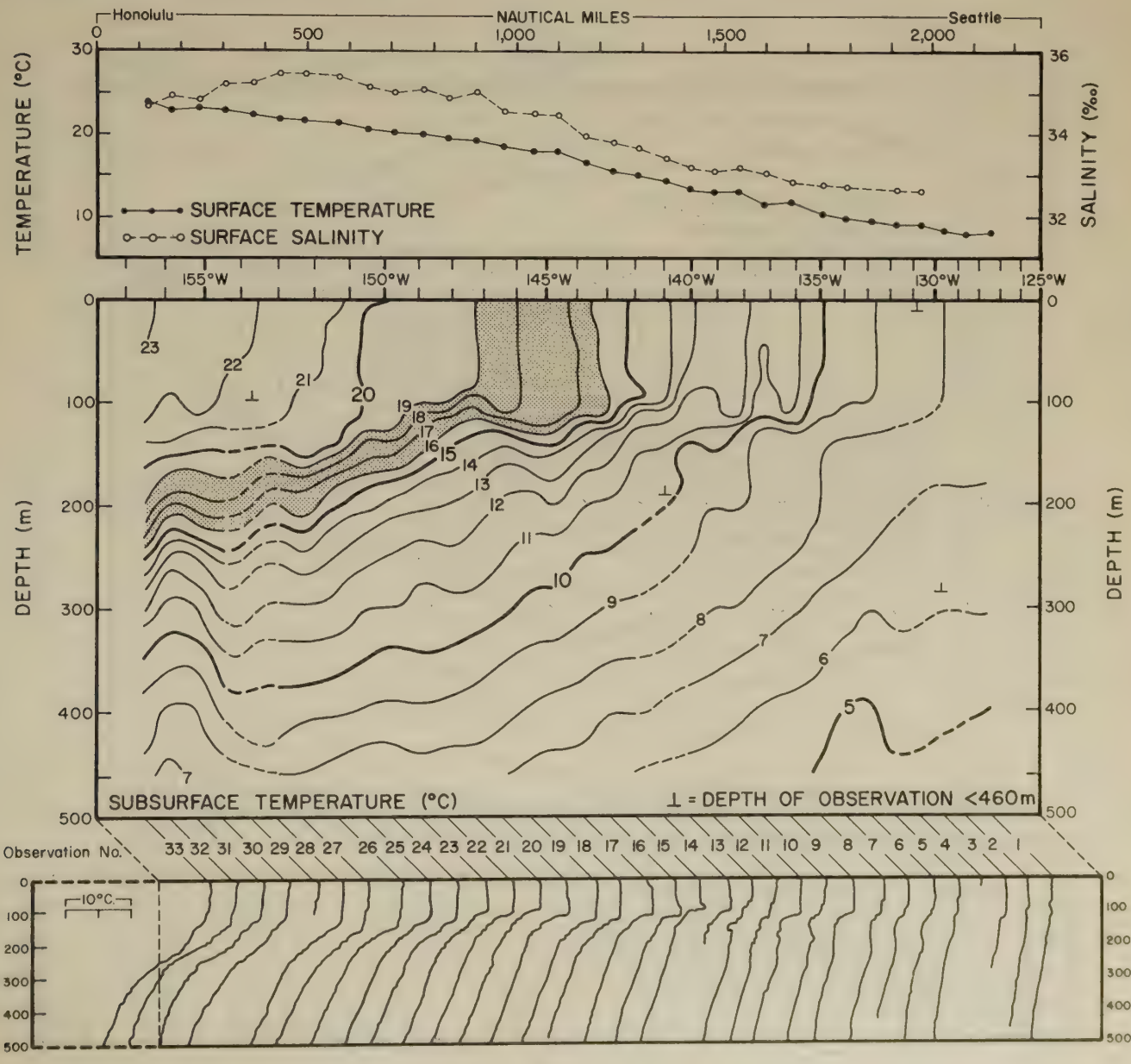
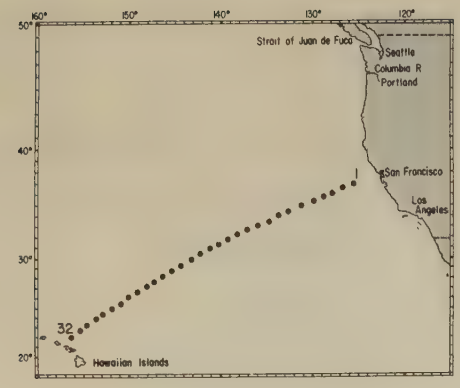
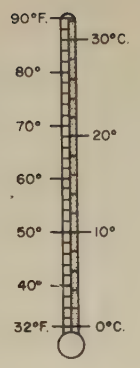


FIGURE 11





HONOLULU – SAN FRANCISCO

MARCH 4-9, 1976

HAWAIIAN QUEEN

VOYAGE 176

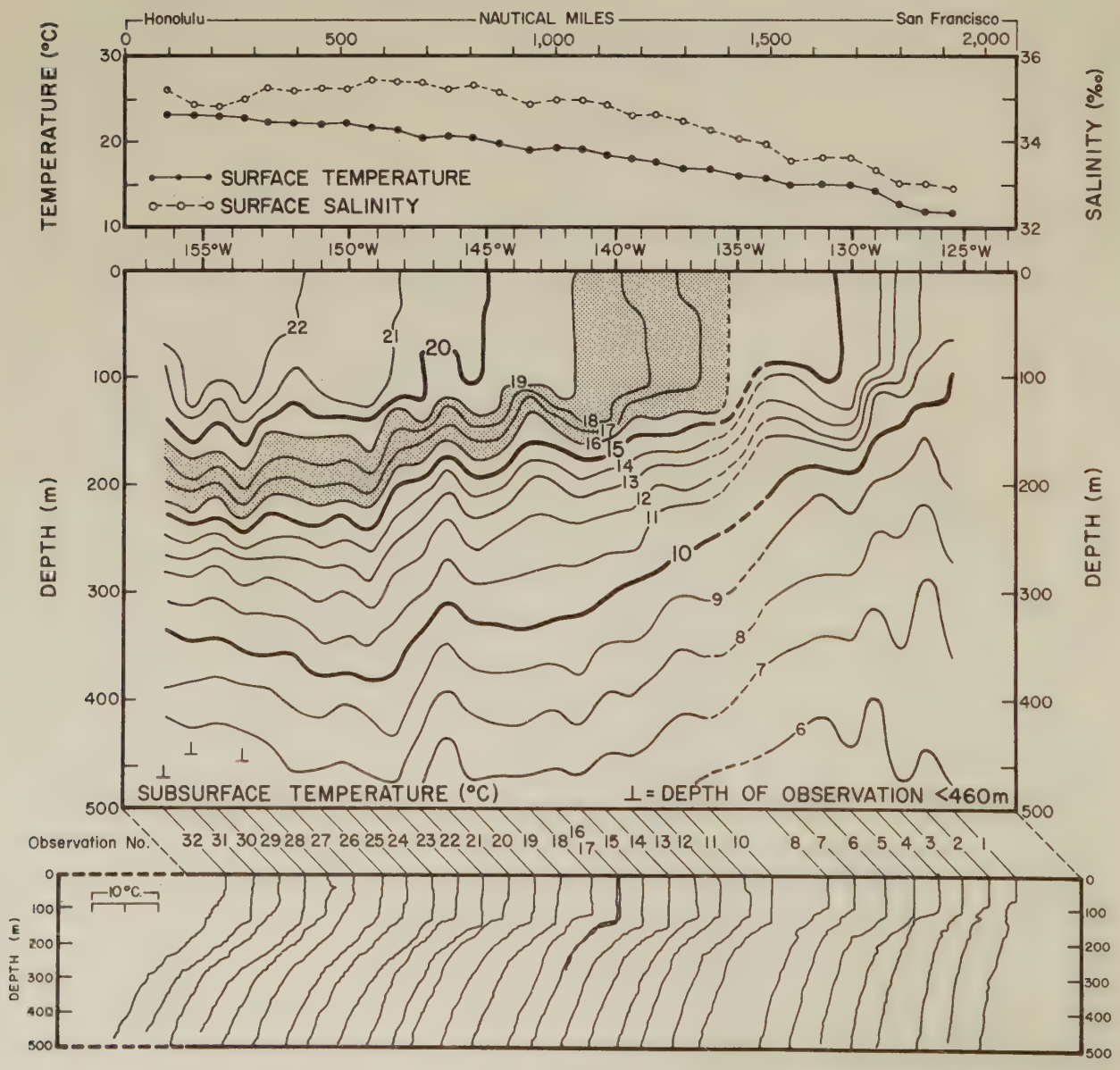
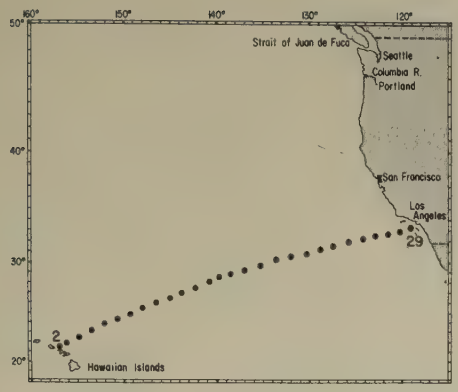
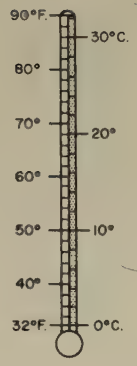


FIGURE 12



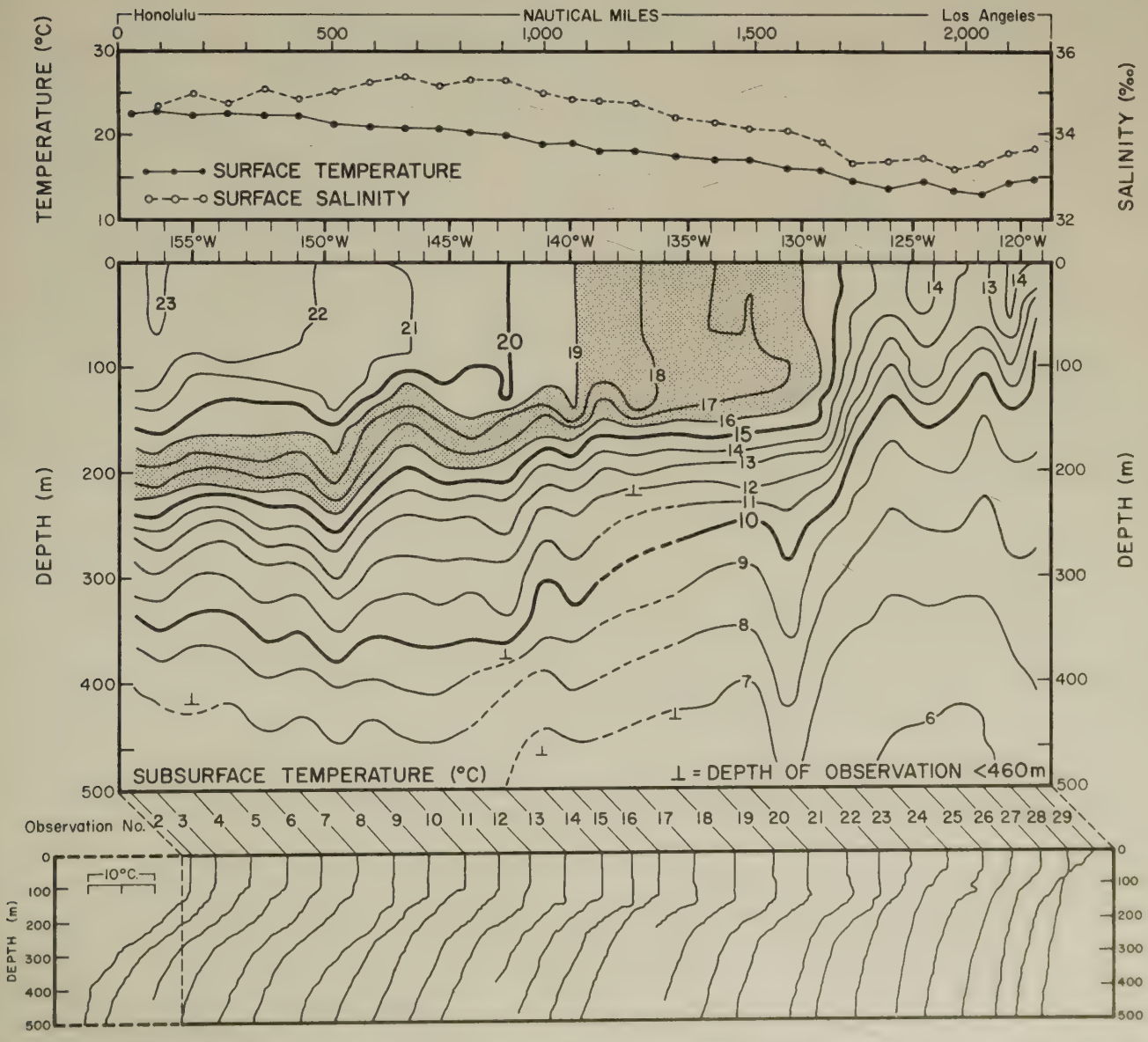


HONOLULU — LOS ANGELES

MARCH 13-17, 1976

HAWAIIAN ENTERPRISE

VOYAGE 136



UNITED STATES
DEPARTMENT OF COMMERCE

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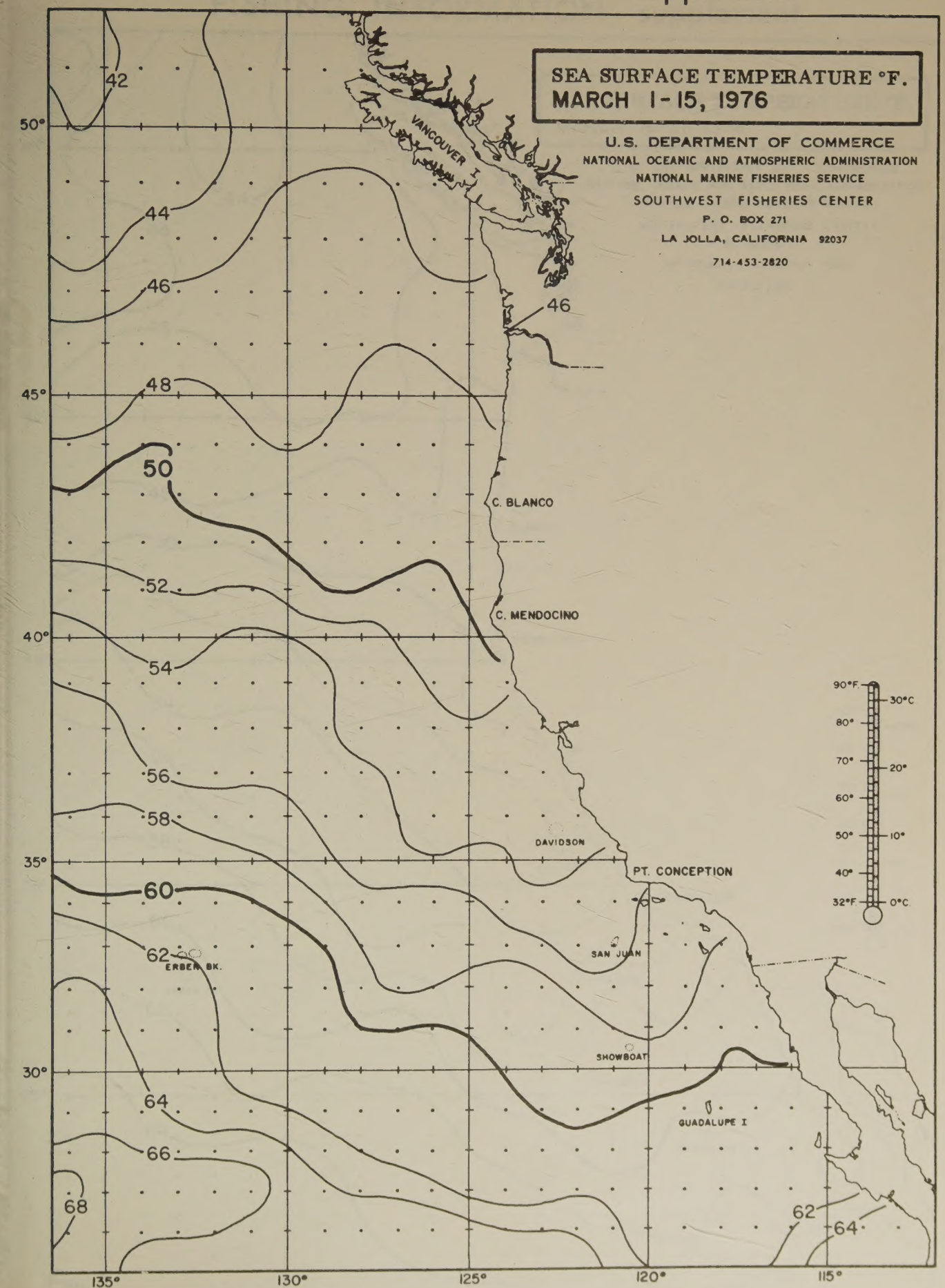

FISHING INFORMATION – supplement